

## EFFECT OF CHANGE IN APPORTIONMENT FORMULA ON GEORGIA CORPORATE TAX LIABILITY

In 2006, Georgia began a two-year transition to a single-factor apportionment formula for corporate income of multistate firms. Firms with income from multistate operations determine the portion of their total corporate tax base that is associated with each state based on that state's apportionment formula. For the years between 1995 and 2006, firms operating in Georgia and other states applied an apportionment formula consisting of a 50 percent weight on sales and a 25 percent weight each on property and payroll. Prior to 1995, Georgia firms with multistate income applied an equally weighted apportionment formula to their corporate earnings. Georgia joins ten other states that by 2008 have adopted a sales-only apportionment formula for multistate corporate income, i.e. a 100 percent weight on sales and a zero weight on property and payroll.

The purpose of this brief is to identify the number and characteristics of corporations that are expected to benefit from the switch to a single-factor apportionment formula and the number and characteristics of those that are not. While the overall effect of the apportionment formula change was estimated to reduce state revenues from the corporate income tax, not all firms will face lower corporate tax liabilities as a result of this change. A firm will benefit

or lose depending on the values of its payroll, property, and sales in Georgia relative to its national payroll, property, and sales and on the value of any tax credits and losses it may have. For the purposes of this brief, we define a benefit as a reduction in a firm's apportionment ratio, which may for some firms lead to a decrease in Georgia tax liability. In addition to considering changes in apportionment ratios, we also consider a broader standard, one in which we define the benefit as a reduction in the firm's Georgia tax liability.

### Apportionment Formula and Corporate Tax Liability

While the Georgia state corporate tax base closely follows the federal corporate tax base,<sup>1</sup> not all of a firm's federal tax base may be subject to tax by the state of Georgia. Those firms which operate in several states apportion their total net business income across all states in which they have nexus in order to determine how much of their total tax base is associated with operations in each state.<sup>2</sup> Firms that operate exclusively within Georgia are not required to apportion their income and therefore their tax liabilities are unaffected by any change to the apportionment formula.

The amount of a firm's corporate income apportioned to each state is determined by that state's apportionment formula. In general, the firm's corporate apportionment ratio (determined by the state corporate apportionment formula) is multiplied by the firm's net business income to determine the percent of the firm's total income that is subject to tax by a given state. The higher the firm's apportionment ratio, the greater the firm's potential state tax liability.<sup>3</sup> The apportionment formula used in Georgia between 1995 and 2006 is expressed in Equation 1 and is referred to as a double-weighted three-factor apportionment formula because it is based on the three-factors of labor, property, and sales, and has a double weight on sales. This is denoted by the 50 percent weight on the ratio of Georgia sales to national sales compared to only a 25 percent weight for either the payroll or property fraction. Prior to 1995, the Georgia apportionment formula had a 33.33 percent weight on all factors. Equation 2 represents the single-factor apportionment formula which is dependent only on the value of sales receipts within the state. This became the Georgia apportionment formula in 2008. In 2008, 11 eleven states used a sales only apportionment formula. The majority of the remaining states used a three-factor formula, many with a double- or greater weight on sales.

$$\text{3-Factor Apportionment Ratio} = 25\%(L_{GA}/L_{US}) + 25\%(P_{GA}/P_{US}) + 50\%(S_{GA}/S_{US}). \text{ (Eq. 1)}$$

$$\text{Single-factor Apportionment Ratio} = 100\%(S_{GA}/S_{US}). \text{ (Eq. 2)}$$

where  $L_{GA}$  = value of property in Georgia held by the firm;  
 $L_{US}$  = value of property everywhere held by the firm;  
 $P_{GA}$  = value of compensation paid to workers in Georgia by the firm;  
 $P_{US}$  = value of compensation paid everywhere by the firm;  
 $S_{GA}$  = value of sales to customers in Georgia;  
 $S_{US}$  = value of sales everywhere by the firm.

For some firms, moving from the apportionment formula shown in equation 1 to the apportionment formula shown in equation 2 will produce an unambiguous gain. For instance, those firms that have no sales presence in Georgia will see their apportionment ratio reduced to zero. On the other hand, firms with only a sales presence but no labor or property, will see their apportionment ratio rise from 50 percent before the change to 100 percent. Non-apportioning firms will see no change. The effect on firms with some presence in terms of property, payroll, and receipts is more ambiguous and clarified with the analysis presented later in this brief.

## Apportionment Changes and Economic Development

As shown in equation 1, under the three-factor apportionment formula, the apportionment ratio increases in value as the value of a firm's employment and facilities within the state increase. With a three-factor formula, firms that increase their employment or property holdings in a state increase the value of their apportionment ratio and face a potentially higher tax liability. Because of this, the three-factor formula has been viewed as an excise tax on labor and property (McLure, 1980) as it creates a disincentive for firms to expand facilities and/or employment in the state. When considered in this light, the move to a single-factor apportionment formula is viewed as the removal of a disincentive to increase employment and expand production in a state.

On the other hand, a sales-only apportionment formula is seen as a violation of the general equity principle and of the benefits received principle. Under a sales-only apportionment formula, firms with production operations in Georgia but with no Georgia-based sales apportion no corporate income to Georgia while firms with similar level of sales to Georgia customers do apportion corporate income to the state. Consider the example of Firm A with \$1,000,000 in sales to customers in Georgia and payroll and property within the state of \$1,000,000 each. Assume Firm A has a profit of \$100,000. Under the sales-only apportionment formula, the tax liability for Firm A is 6 percent (which is the Georgia corporate income tax rate) of \$100,000 or \$6,000. Compare this to Firm B with \$1,000,000 of sales to customers in Alabama and no sales in Georgia but with payroll and property within Georgia of \$1,000,000. Assume Firm B also has a profit of \$100,000. Under the sales-only apportionment formula, the tax liability for Firm B is \$0 since it has no Georgia-based sales. Yet because the two firms obtain similar benefits from the state, an inequity is created between Firms A and B with regard to their state tax burden.

In addition, the single-apportionment formula further weakens the tenuous link between the value of a firm's corporate tax liability and the value of benefits it receives from the state. According to benefits received principle, governments provide public services that are of value to firms and firms should be taxed according to the value of the benefits they receive. For instance, companies benefit from transportation, the court system, and education expenditures provided by the state, among other services. With a sales-only apportionment formula, the tax liability is based only on the value of Georgia sales, without regard for the value placed on the services provided by the government. While this principle is also violated under the more traditional form of the corporate income tax, such as that using the double-weighted three-factor apportionment formula, a tax liability dependent on the presence

of employment and property in a state provides a stronger tie between the taxes paid and benefits received.<sup>4</sup>

### **Empirical Evidence**

There have been several studies on the effects of the choice of corporate apportionment factors and their bearing on the employment and economic growth in a state. Goolsbee and Maydew (2000) find that the payroll factor is a significant determinant in the level of manufacturing employment in the state. Based on their analysis, moving from an equally-weighted formula to a double-weighted formula would on average increase state manufacturing employment by 1.1 percent. Evidence from Gupta and Hofmann (2003) support the premise that capital investment in a state is significantly and negatively related to the weight placed on the property factor.

On the other hand, the advantage of single-factor apportionment comes from the opportunity for the firm to allocate operations between states so as to minimize their overall tax liability (Mazerov, 2005). If all states had a single-factor formula, the advantage experienced by any one state would be greatly diminished. Edmiston (2002) simulates the effect of all states moving simultaneously to a single-factor apportionment formula. The author finds that once all states adopt the formula, the gains, in terms of increased employment and capital infrastructure, are greatly reduced and even result in an overall loss for some states. That is, while any one state benefits from the move to a reduced weight on payroll and property when other states keep the equally-weighted formula, the size of the resulting effect in terms of increased employment and investment is dependent on the apportionment strategy of their neighbors. Goolsbee and Maydew, while finding positive effects for a single state moving from an equally-weighted three-factor formula to a formula with a reduced weight on payroll, also find that nationally the effect tends to zero. This implies that while there are gains in employment for some states, they come at the expense of employment losses in other states.

### **Georgia Corporate Data and Simulation**

In 2005, 35 percent of Georgia corporate tax filers apportioned their corporate income, as shown in Table 1. The remaining firms earned all their income from operations within the state and did not apportion their income on the corporate return. Compared to the population of corporate filers as a whole, apportioning firms are larger in terms of the value of their net worth and have a higher tax liability on average than nonapportioning firms.

To assess the impact of changing the state apportionment formula on the apportionment ratio of firms, we compute the apportionment ratio for each firm in the Georgia Department of Revenue Master Corporate file under a sales-only apportionment formula using the 2005 corporate returns.<sup>5</sup> We also compute the three-factor ratio for each apportioning firm in the dataset in order to assure the reliability of the data and for purposes of consistency. For the large majority of our observations, the simulated three-factor ratio matched the reported three-factor ratio. The simulated single-factor apportionment ratio is then compared to the three-factor double sales-weighted formula in use in 2005. Those firms for which the switch to a single-factor apportionment formula results in a reduction in the apportionment ratio are designated as winning firms, while those for which the single-factor formula switch results in a higher apportionment ratio are designated as losing firms.

Another obvious classification is to classify winning firms as those for which the switch results in a lower tax liability. Since many firms face a zero tax liability under either apportionment formula (single or three-factor) due to tax credits, operating losses or carryforwards, fewer firms are classified as winning or losing firms under this classification scheme. For this reason, we use the change in the value of the apportionment ratio as the benchmark by which we judge the effects of the change in the apportionment formula. Later tables present the revenue implications of the apportionment formula change, which are dependent on the value of the change in tax liability resulting from the switch in apportionment formulas.

### **Effect of Change in Apportionment Formula**

Based on our simulated apportionment ratios for the 2005 pool of corporate returns with apportioning income presented in Table 2, 9,554 returns or 33 percent experienced a reduction in their apportionment ratio by an average of 49 percent. At the same time, 13,024 or 45 percent of firms experienced an increase in their apportionment ratio of 52 percent on average. In addition to the nonapportioning firms, figures in column 3 include 4,544 apportioning firms that experienced no change in their apportionment ratio because they reported no national property or national employment but had positive receipts nationally and in Georgia. As such, the current apportionment formula for these firms was already reduced to a single-factor formula and the apportionment change had no effect.<sup>6</sup>

Data presented in Table 3 indicates that winning firms have significantly higher net worth than losing firms. This is not an unexpected finding. A greater Georgia net worth value is synonymous with larger property holdings, which are included in the three-factor apportionment formula but not in the single-factor formula. Therefore, those firms with larger values for

**TABLE 1. APPORTIONING AND NONAPPORTIONING FIRMS, 2005**

	<b>All Firms</b>	<b>Apportioning Firms</b>	<b>Nonapportioning Firms</b>
Number of Filers	82,088	28,731	53,357
Average Georgia Net Worth	\$5,892,209	\$7,392,633	\$5,084,279
Average Georgia Tax Liability	\$7,433	\$17,078	\$2,239
% with Positive Tax Liability	35%	40%	32%
Average Georgia Apportionment Ratio	0.69	0.12	1.0

Source: Author's calculation from Georgia Department of Revenue (2005).

**TABLE 2. FIRMS WITH CHANGE IN APPORTIONMENT RATIO**

<b>All Corporate Filers</b>	<b>Firms w/ an Apportionment Ratio Reduction</b>	<b>Firms w/ an Apportionment Ratio Increase</b>	<b>Firms w/ No Change in the Apportionment Ratio</b>
Number	9,554	13,024	57,901
Average Percent Change in Apportionment Ratio	-49%	52%	0%

Source: Author's calculation from Georgia Department of Revenue (2005).

**TABLE 3. CHARACTERISTICS OF WINNING AND LOSING FIRMS, 2005**

	<b>Average Value for Firms w/ an Apportionment Ratio Reduction</b>	<b>Average Value for Firms w/ an Apportionment Ratio Increase</b>
Georgia Net Worth	\$14,982,280	\$3,907,584
Georgia Tax Liability	\$30,692	\$14,372
Georgia Receipts	\$23,058,647	\$59,245,187
Apportionment Ratio	0.21	0.09
Value of $L_{GA}/L_{US}$	29.5%	5.9%
Value of $P_{GA}/P_{US}$	28.2%	6.3%
Value of $S_{GA}/S_{US}$	14.1%	11.2%

Source: Author's calculation from Georgia Department of Revenue (2005).

Georgia property or payroll relative to receipts are the firms experiencing the greatest benefit from the switch to the single-factor formula. Those firms which have only a little property or payroll presence in Georgia, as captured by their low apportionment rates, are those with an increase in their apportionment ratios.

For example, consider a firm domiciled in Alabama with no property or payroll in Georgia but gross receipts from sales to customers in Georgia.<sup>7</sup> Under a double-weighted three-factor apportionment formula, this firm has an apportionment ratio equal to  $0.5 \cdot (S_{GA}/S_{US})$ .<sup>8</sup> Under the single-factor apportionment formula the firm's apportionment ratio increases to  $1.0 \cdot (S_{GA}/S_{US})$ . According to our classification system, this firm would be categorized as a losing firm. On the other hand, a firm with substantial property and payroll associated with Georgia, such as firms domiciled in Georgia, would move from an apportionment ratio represented by equation 1 to a ratio represented by equation 2. The direction of change is not immediately apparent and will vary between firms. For a typical firm domiciled in Georgia, the ratio of  $(L_{GA}/L_{US})$  and  $(P_{GA}/P_{US})$  are much greater in value than for firms not domiciled in Georgia. Therefore, their apportionment ratio computed under the double-weighted three-factor formula is in many cases higher than the ratio computed under the single-factor formula, even with the higher weight placed on sales. This is seen in Table 3 by focusing on the relative values of the property, compensation, and sales ratios. Winning firms have much higher values of property and payroll relative to the losing firms but values of receipts that are similar. Thus, these firms benefit from the switch to a single-factor formula because the reduction in the apportionment ratio associated with the elimination of the property or payroll ratios is greater than the increase in the apportionment ratio due to the higher weight on gross receipts.

In many states, this type of apportionment change has been undertaken in the name of economic development, as discussed earlier. To determine how the formula change affected domestic firms, we classify the winning and losing firms by their domestic/foreign status. As shown in Table 4, 58 percent of Georgia apportioning firms and 32 percent of non-Georgia based firms affected by the apportionment formula change are predicted to benefit from the switch to a single-factor formula in the sense that their apportionment ratios decline in value.<sup>9</sup> 19 percent of Georgia firms experience an increase in their apportionment ratio based on our simulations, compared to 52 percent of firms incorporated outside of Georgia.

## Revenue Consequences

As stated earlier, our criteria for determining winning and losing firms is based on the change in a firm's apportionment ratio as opposed to their tax liability. Not all firms that experience a reduction in their apportionment ratio see a reduction in their tax liability, nor do all firms that experience an increase in their apportionment ratio see an increase in their tax liability. In fact, based on results from these simulations, 49 percent of all firms with a decrease in their apportionment ratio see no change in their tax liability. This is because these firms have negative taxable income and hence a zero tax liability under either the three-factor or single-factor apportionment formula. This is usually the result of a large negative value for federal taxable income. On average, firms with a decrease in their apportionment ratio see a tax savings of \$18,238 and firms that see an increase in their apportionment ratio are predicted to experience a tax increase of \$7,684, as shown in Table 5. Overall the net revenue loss is estimated to be \$74 million.

It is important to note that this analysis does not take into account any change in behavior by the firm as a result of the change in the apportionment formula. The anticipated behavioral changes could work in two directions. First, firms may reallocate the location of their sales nationally and in Georgia in response to the apportionment formula change in a manner that will at least mitigate the increase in tax liability within Georgia. Edmiston and Arze (2002) consider the effect of the 1995 switch from an equally-weighted three-factor formula to a double-weighted sales formula on the national and state allocation of sales of firms operating in Georgia. The authors found that firms operating in Georgia lowered their levels of sales in Georgia by 9 percent in response to the switch in apportionment formulas. This potential behavioral response serves to increase the revenue loss to the state.

The second anticipated behavioral change is an increase in employment creating an increase in income tax revenues of some amount. This behavioral effect works to reduce the revenue loss associated with the apportionment formula change. Edmiston (2003) estimated that moving from a double-weighted sales formula to a single-factor formula increases multistate corporate payroll in Georgia by about \$200 to \$400 million over a three-year period after the formula switch. Since these effects work in opposite directions, it is not possible to determine the overall revenue effect inclusive of these behaviors to the state of Georgia. In addition, the increase in employment may lead to the increased use of job tax credits by firms which can also serve to reduce their corporate tax liability.

**TABLE 4. FIRMS AFFECTED BY APPORTIONMENT CHANGE BY DOMICILE STATUS**

<b>Apportioning Firms Only</b>	<b>Apportionment Ratio Reduction</b>	<b>Apportionment Ratio Increase</b>
Georgia Firms	58%	19%
Non-Georgia Firms	32%	52%

Source: Author's calculation from Georgia Department of Revenue (2005). Totals do not add because some firms experienced no change in their apportionment ratio.

**TABLE 5. REVENUE CONSEQUENCES OF APPORTIONMENT CHANGE**

<b>Apportioning Firms Only</b>	<b>Firms w/ an Apportionment Ratio Reduction</b>	<b>Firms w/ an Apportionment Ratio Increase</b>
Average Change in Tax Liability	-\$18,238	\$7,684
% with No Change in Tax Liability	49%	42%
Sum of Tax Liability Change	-\$174,241,802	\$100,078,065
2005 Net Revenue Effect (No behavioral effect)	-\$74,163,737	

Source: Author's calculation from Georgia Department of Revenue (2005).

**TABLE 6. REVENUE CONSEQUENCES OF APPORTIONMENT CHANGE BY STATE OF INCORPORATION**

<b>Apportioning Firms Only</b>	<b>Firms w/ an Apportionment Ratio Reduction</b>	<b>Firms w/ an Apportionment Ratio Increase</b>
Average Tax Effect of Georgia corporate filers	-\$25,664	\$4,380
Total revenue effect of Georgia Corporate filers	\$-52,969,826	\$2,991,710
Average Tax Effect of Non-Georgia corporate filers	-\$16,191	\$7,867
Total revenue effect of Non-Georgia corporate filers	\$-121,271,976	\$97,086,355

Source: Author's calculation from Georgia Department of Revenue (2005).

**TABLE 7. AVERAGE CHANGE IN TAX LIABILITY BY NET WORTH**

<b>Apportioning Firms Only</b>	<b>Firms w/ an apportionment ratio reduction</b>	<b>Firms w/ an apportionment ratio increase</b>
Georgia Net worth<\$0	-\$7,592	\$3,076
Georgia Net worth=\$0	-\$4,166	\$3,812
\$0< Georgia Net Worth≤\$1,000	-\$1,255	\$53
\$1,000< Georgia Net Worth≤\$100,000	-\$1,213	\$405
\$100,000< Georgia Net Worth≤\$1,000,000	-\$4,061	\$2,108
\$1,000,000< Georgia Net Worth	-\$56,531	\$26,310

Source: Author's calculation from Georgia Department of Revenue (2005).

Table 6 shows that the winning Georgia firms are predicted by the simulations to experience an average tax savings of \$25,664 and the losing Georgia firms are expected to experience an average tax increase of \$4,380. Total predicted gains to Georgia firms are estimated to be \$53 million and losses are estimated to be \$3 million. Non-Georgia firms benefitting from the change are estimated to incur an average tax savings of \$16,191, while non-Georgia firms harmed by the change in the apportionment formula are predicted to have an increase in their average tax liability of \$7,867. Total gains and losses for non-Georgia firms exceed those of Georgia firms because there are more non-Georgia firms.

Table 7 provides the average tax liability increase and decrease by the net worth of the firms. For both the winning and losing firms, the greatest activity is concentrated among firms at the highest level of the net worth distribution. Winning firms with assets in excess of \$1,000,000 account for 27 percent of all winning firms but account for 82 percent of all tax savings, with an average tax savings of \$56,531 per firm. Losing firms face a similar, though not as dramatic distribution of tax increase. Firms in the top asset category constitute 24 percent of all firms that are harmed by the formula change but bear 84 percent of the increase in tax liability, with an average tax increase of \$26,310 for firms with net worth in excess of \$1,000,000.

## Conclusion

This brief explores the characteristics of firms likely to benefit and lose from the switch to a single-factor apportionment formula. As expected, we find that firms with large investments in property and large payroll expenses relative to sales within the state are those that benefit from the change. While our results show that there are more firms harmed by the switch, their aggregate increase in tax liability is less than the aggregate decrease for the firms that benefit. Thus, the switch to a single-factor formula results in a net revenue loss to the state. In addition, we find that in terms of Georgia firms, the gains to the winners far exceed the losses to the losing firms. The difference between gains and losses is not as great for the non-Georgia firms. Lastly, we find that the greatest gains and losses are associated with firms for which net worth exceeds \$1 million.

## Notes

1. There are several additions and subtractions that are required to bring a firm's federal base in line with the state base. For instance, firms are required to add back the value of the federal deduction for bonus depreciation when computing their state tax base.

2. Corporations owe state corporate tax in each state in which they have nexus. The rules for establishing nexus vary by state. Based on Georgia tax regulations, under certain conditions firms may still have nexus in Georgia even if they have no payroll or property within the state.

3. Because of a lack of uniformity between state corporate tax rules, the sum of the state tax bases may be greater than, equal to, or less than the firm's federal tax base.

4. See Oakland (1992) for a more complete discussion.

5. The 2005 returns are the most recent data available to the Fiscal Research Center at the time of this research.

6. According to the Georgia revenue code, firms reporting a zero value for national payroll and property were subject to a 100 percent weight on their sales in Georgia for purposes of determining that portion of the firm's multistate income that is subject to Georgia corporate income tax. This was a special rule applying only to these firms and was in place before the 2006-2008 transition to a single-factor formula for all firms.

7. Because of the manner in which the apportionment factors are defined, under some circumstances a firm can have only receipts in Georgia and still meet the nexus requirement to file a corporate return. This situation is not representative of the norm but the simplicity is useful for this example.

8. In this example, it is assumed that the firm has property and payroll expenses in Alabama.

9. These percentage values exclude firms that do not apportion and apportioning firms that are not affected by the change in the apportionment formula.

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*By the Numbers: Property Taxes in Georgia.* This report presents data on the property tax in Georgia, considering the growth in property tax base and property tax revenue, how the tax base varies by county, changes over time, and property taxes by type of government. (June 2008)

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*Tax Revenue Stability of Replacing the Property Tax with a Sales Tax.* This policy brief discusses the implications for tax revenue stability of proposals that would replace the property tax with an increased sales tax. (September 2007)

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